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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/066,124      | 01/30/2002  | Gregory J. Wells     | 01-40 US            | 3336             |

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Varian Inc.  
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EXAMINER

JOHNSTON, PHILLIP A

ART UNIT PAPER NUMBER

2881

DATE MAILED: 04/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/066,124

Applicant(s)

WELLS ET AL.

Examiner

Phillip A Johnston

Art Unit

2881

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

***Detailed Action***

***Claims Rejection – 35 U.S.C. 112***

1. Claim 8 recites the limitation " when said plates are biased with different voltages". There is insufficient antecedent basis for this limitation in the claim.

***Claims Rejection – 35 U.S.C. 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claim 1 is rejected under 35 U.S.C. 102 (b) as being clearly anticipated by U.S. Patent No. 5,576,540 to Jolliffe.

Jolliffe (540) discloses a mass spectrometer with radial ejection, where a vacuum chamber 31 contains a set of quadrupole rods 32, consisting of four rods 32-1 to 32-4 inclusive (FIG. 2), extending parallel to each other and spaced apart to define an elongated interior volume 36. Volume 36 extends lengthwise along the longitudinal central axis 38 of the rod set 32 and has a radial dimension  $r$  (FIG. 2). Rods 32-1 and 32-3 will also be called the  $x$  rods, since they are on the  $x$ -axis, and rods 32-2 and 32-4 will be called the  $y$  rods since they are on the  $y$ -axis. See Column 3, line 57-65.

In operation, the volume 36 within the rod set 32 will be filled with ions. As indicated in FIG. 5A which shows the end caps 85 and ring electrodes 86 of a conventional ion trap, the ions for good resolution should be collapsed into a small volume 87 centered about the center of the trap. The cross-section of volume 87 is typically an ellipsoid the longer axis of which is 5.0 mm long. Collapsing of the ions into this volume is accomplished, as is well known, by introducing damping gas into the ion trap. This permits the ions to be located in a small volume from which they are then ejected. See Column 4, line 65-67; and Column 5, line 1-12.

It is implied herein that the same voltage is initially applied to each rod to collapse (focus) the ions along the central axis of the ion trap.

Jolliffe (540) also discloses that the thermalizing effect on the ions due to collisions with gas in volume 36 will compress them into a relatively small volume 88 (FIG. 2) along axis 38. (The ions in effect migrate to positions where the electric forces on them approach zero, and the zero potential line is along axis 38.) To speed up ejection of the ions during the scanning phase, a small dipole AC field may be applied in known manner between two of the rods, e.g. rods 32-1 and 32-3, to move the ions off center (deflecting an ion flow, as recited in Claim 1) during the scanning interval. See Column 7, line 64-67; and Column 8, line 1-5.

***Claims Rejection – 35 U.S.C. 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jolliffe, U.S. Patent No. 5,576,540, in view of Wang, U.S. Patent Application Pub No. 2002/0121594.

Regarding Claims 1-12, Jolliffe (540) discloses a mass spectrometer with radial ejection, where a vacuum chamber 31 contains a set of quadrupole rods 32, consisting of four rods 32-1 to 32-4 inclusive (FIG. 2), extending parallel to each other and spaced apart to define an elongated interior volume 36. Volume 36 extends lengthwise along the longitudinal central axis 38 of the rod set 32 and has a radial dimension  $r$  (FIG. 2). Rods 32-1 and 32-3 will also be called the  $x$  rods, since they are on the  $x$ -axis, and rods 32-2 and 32-4 will be called the  $y$  rods since they are on the  $y$ -axis. See Column 3, line 57-65. In operation, the volume 36 within the rod set 32 will be filled with ions. As indicated in FIG. 5A which shows the end caps 85 and ring electrodes 86 of a conventional ion trap, the ions for good resolution should be collapsed into a small volume 87 centered about the center of the trap. The cross-section of volume 87 is typically an ellipsoid the longer axis of which is 5.0 mm long.

Collapsing of the ions into this volume is accomplished, as is well known, by introducing damping gas into the ion trap. This permits the ions to be located in a small volume from which they are then ejected. See Column 4, line 65-67; and Column 5, line 1-12.

Jolliffe (540) also discloses that the thermalizing effect on the ions due to collisions with gas in volume 36 will compress them into a relatively small volume 88 (FIG. 2) along axis 38. (The ions in effect migrate to positions where the electric forces on them approach zero, and the zero potential line is along axis 38.) To speed up ejection of the ions during the scanning phase, a small dipole AC field may be applied in known manner between two of the rods, e.g. rods 32-1 and 32-3, to move the ions off center (deflecting an ion flow, as recited in Claim 1) during the scanning interval.

Jolliffe (540) as applied above does not disclose the use of a multipole ion guide having end cap lens' for directing ions, as recited in Claims 2-12. However, Wang (540) discloses a dual ion trap TOF mass spectrometer that comprises an ion source 151, a plurality of pressure regions 164-168, capillary 152 having endcap electrodes at its entrance end 154 and exit end 155, pre-hexapole ion guide 156, skimmers 157 & 171, main hexapole or first ion trap 153, first gating electrode 179, optional focusing optics 189 & 173, analytical multipole 169, second gating electrode 174, second ion trap 161, third gating electrode 176, optional focusing optics 192, 193 & 194 and TOF mass analyzer 163. See page 7, paragraph [0055]

Therefore it would have been obvious to one of ordinary skill in the art that Jolliffes' (824) mass spectrometer can be modified to use multipole ion guide apparatus in accordance with Wang, if so desired.

Regarding Claims 13 and 14, Wang (594) also discloses that, as the ions are gated out from second trap/collision cell 161 by gate electrode 176, additional ion optics 192, 193, 194 (i.e., accelerating or focusing elements) may be employed to further focus and/or accelerate the ions into mass analyzer 163. Mass analyzer 163, as shown, is an orthogonal time-of-flight mass analyzer comprising drift region 160, accelerator 197, multideflector 196, lens 191, reflectron 190 and detector 198. See page 9, paragraph[0069].

### ***Conclusion***

6. Any inquiry concerning this communication or earlier communications should be directed to Phillip Johnston whose telephone number is (703) 305-7022. The examiner can normally be reached on Monday-Friday from 7:30 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiners supervisor John Lee can be reached at (703) 308-4116. The fax phone numbers are (703) 872-9318 for regular response activity, and (703) 872-9319 for after-final responses. In addition the customer service fax number is (703) 872- 9317.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

PJ

April 16, 2003



JOHN R. LEE  
SUPERVISORY PATENT EXAMINER  
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